PORT OF SEATTLE MEMORANDUM

COMMISSION AGENDA – STAFF BRIEFING

Item No.	7a
Date of Meeting	July 12, 2011

DATE: July 5, 2011

TO: Tay Yoshitani, Chief Executive Officer

FROM: Stephanie Jones Stebbins, Director Seaport Environmental and Planning Programs

Sarah Flagg, Seaport Air Quality Program Manager

SUBJECT: Briefing on the Northwest Ports Clean Air Strategy 2010 Implementation Report and

the interim report on accelerating Seaport Clean Air Goals

SYNOPSIS:

The Port of Seattle Seaport Air Quality Program began in earnest in 2004, after the release of the Puget Sound Clean Air Agency's first Air Toxics Evaluation (2003), which showed that 78% of the public health risk in Puget Sound comes from diesel. Though the Seattle region was, and continues to be, in attainment for the National Ambient Air Quality Standards (NAAQS), the Port recognized it had a unique opportunity to develop a proactive and collaborative approach to reduce emissions from maritime operations and protect public health.

In order to develop a fact-based approach, the Port voluntarily initiated and managed the first effort to locate and quantify sources of maritime air emissions in the Puget Sound region. This effort, the 2005 Puget Sound Maritime Air Emissions Inventory (2005 EI), was led by a Steering Committee of 14 funding partners, which included regulatory agencies, ports, industry associations, industry, and non-governmental organizations. The product was a comprehensive baseline of all maritime-related emission sources (ocean-going vessels, cargo-handling equipment, trucks, rail, and harbor vessels) in the greater Puget Sound region, and the first to include greenhouse gases. Today, the 2005 EI remains the most comprehensive maritime emissions inventory ever conducted.

On January 22, 2008, the Port of Seattle (Port) Commission adopted the Northwest Ports Clean Air Strategy, a voluntary and collaborative effort of the Ports of Seattle, Tacoma, and Vancouver, B.C., to reduce maritime and port-related emissions that affect air quality and climate change in the Pacific Northwest. The Strategy established short-term (2010) and long-term (2015) performance measures to reduce emissions from cargo-handling equipment, rail, harbor vessels, ocean-going vessels, and trucks. The Strategy followed closely on the heels of the release of the First Puget Sound Maritime Emissions Inventory, released in early 2007. That inventory showed the emissions from all Maritime sources in Puget Sound as well as emissions associated with different sectors of maritime operations. On June 14, 2011, the ports released the 2010 Implementation Report, documenting successes in meeting the short-term Strategy goals.

On January 4, 2011, the Port Commission adopted the "Motion to Accelerate Seaport Clean Air Goals to 2015," directing staff to present options for accelerating the Clean Air Strategy implementation. The motion also directed staff to provide an interim briefing in mid-2011, draft recommendations at the end of 2011, and present final recommendations in mid-2012.

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BRIEFING OUTLINE:

Port staff will provide an update on the Port's current air quality program efforts, including public requests for information and qualifications, the Second Puget Sound Maritime Emissions Inventory. Staff will also provide an update on efforts to evaluate options for accelerating Seaport Clean Air Strategy goals. This will include emission reduction options for ocean-going vessels, cargohandling equipment, and trucks, and an update on the Emission Inventory in progress. Staff will also provide a briefing on the Northwest Ports Clean Air Strategy 2010 Implementation Report.

Northwest Ports Clean Air Strategy 2010 Implementation Report:

On January 22, 2008, the Port of Seattle (Port) Commission adopted the Northwest Ports Clean Air Strategy, a voluntary and collaborative effort of the Ports of Seattle, Tacoma, and Vancouver, B.C., to reduce maritime and port-related emissions that affect air quality and climate change in the Pacific Northwest. The Strategy established short-term (2010) and long-term (2015) performance measures to reduce emissions from cargo-handling equipment, rail, harbor vessels, ocean-going vessels, and trucks. On June 14, 2011, the ports released the 2010 Implementation Report, documenting successes in meeting the short-term Strategy goals.

The Port of Seattle success in reaching the short-term (2010) Strategy goals are as follows:

Ocean-Going Vessels (OGV)

72.4% of all frequent ocean-going vessel calls (cruise and container ships) met or exceeded the 2010 OGV performance measure. The Port had a total of 1015 OGV calls in 2010, 830 of which were made by frequent-calling vessels.

- 100% of the 223 frequent cruise vessel calls met or exceeded the 2010 OGV performance measure.
 - o 38.6% of cruise vessels participated in the At-Berth Clean Fuels Program and used <0.5% sulfur fuel while at berth.
- 62% of frequently calling container vessel calls (378) met the 2010 OGV performance measure by participating in the At-Berth Clean Fuels Program and using ≤0.5% sulfur diesel fuel in auxiliary engines while at berth.

The highly successful At-Berth Clean Fuels Vessel Incentive Program (ABC Fuels), launched on January 1, 2009, provides an incentive to frequent calling vessels that use 0.5% (or less) sulfur fuels in auxiliary engines while at berth. In 2010, the incentive was increased from \$1,500 to \$2,250 per call, with an intention of covering close to 50% of the cost differential of using more expensive fuel. Participation in ABC Fuels requires per call reporting and periodic audits, which in 2009 and 2010, were conducted by Det Norske Veritas and Port staff. In addition, all homeported cruise ships that call to the Port of Seattle are required, via the tariff, to either plug in to shore power or use 1.5% (or less) sulfur fuels in their diesel electric main engines while at berth.

2011 Implementation Efforts

Port of Seattle continues to work towards increased participation in the ABC program to achieve further emission reductions in 2011. In 2011, the ABC Fuels Program contains a tiered incentive, based on fuel use while in port, to more equitably cover increased fuel costs. This new incentive structure is expected to result in higher participation rates in the ABC program.

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- Tier I for 1 9.99 MT < 0.5% sulfur fuel burned at berth \$1200 incentive
- Tier II for 10 19.99% MT <0.5% sulfur fuel burned at berth \$2250 incentive
- Tier III for 20+ MT <0.5% sulfur fuel burned at-berth -\$2850 incentive

Cargo-Handling Equipment (CHE)

- 55% of all CHE at Port of Seattle met the 2010 performance measure.
- 100% of all CHE used ultra low sulfur diesel (ULSD) fuel and/or biodiesel blends.

Since 2005, the Port has been working with the marine terminal operators to reduce emission from CHE via use of cleaner fuels, exhaust controls, and purchase of new equipment. The marine terminal operators voluntarily switched from off-road high sulfur diesel fuel to ultra-low sulfur diesel fuel and biodiesel blends in 2005. By the end of 2009, all eligible CHE had been retrofitted with Level 1 exhaust controls (Diesel Oxidation Catalysts) which reduced particulate matter emissions by 25%. As new technologies became commercially available, the Port worked with the marine terminal operators and our regulatory agency partners (Puget Sound Clean Air Agency, Washington Department of Ecology, and U.S. EPA) to install Level 2 exhaust controls (Diesel Multistage Filters [DMFs]), which reduce particulate matter emissions up to 50%. In 2009, 69 In DMFs, manufactured by Donaldson Company, Inc. (DCI) were installed on Port of Seattle CHE; in 2010, all 69 DMFs were required to be removed due to equipment failure. The DMFs were verified by U.S. EPA and California Air Resources Board (CARB) and marketed and warranted as a "no maintenance" device (no periodic filter cleaning is needed), ideally suited for vehicles and equipment with low exhaust temperature and impossible to plug. In Washington State, contractors installed DMFs on 608 diesel engines. Overall, about 15% of the installed DMFs failed due to the device plugging with soot, with a high percentage of those failures being on cargo handling equipment. This failure resulted in the revoking of verified status by CARB and U.S. EPA. Based on recent field test results, DCI recommended the DMF be removed from all cargo handling equipment, at their expense. The removal of the DMFs from CHE at Port of Seattle terminals lowered the percentage of CHE meeting the 2010 performance measure. Had these devices been fully functional and had they not been removed, 78% of CHE at the Port of Seattle would have met the 2010 performance measure.

2011 Implementation Efforts

Port staff continues with MTOs to identify alternative emission reduction approaches and technologies, such as evaluating the feasibility of liquefied natural gas (LNG), compressed natural gas (CNG), hybrid and electric options, and identifying verified exhaust treatment technologies which will achieve the highest practical PM reductions for existing equipment and integrate those technologies into retrofit projects. In addition, we are working with MTOs to identify sources of funding to purchase new CHE to replace older models that cannot be retrofitted with emission reduction devices. In 2011, we also applied for a grant from the U.S. EPA that would have installed EcoCrane hybrid systems on two rubber tired gantry cranes (RTGs) at Terminal 18, which is a technology that the Port has been researching through our EcoPartnership with the Port of Dalian. Hybrid technologies for RTG are classified as "emerging" by the U.S. EPA due to their recent development; the EcoCrane hybrid technology is expected to be considered "verified" by the U.S. EPA within the next year, pending completion of required operational and emission testing. Unfortunately, the Port did not receive this U.S. EPA grant because the RTG engines at Terminal 18 are a higher horsepower than the technology is currently approved for under the U.S. EPA

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Emerging Technologies program. However, Port staff continues to seek funding options for this technology.

Rail

In 2010, the Port of Seattle reached its 2010 performance measure of supporting the local rail companies in adopting US EPA SmartWay standards. In the first quarter of 2010, idle-reduction equipment was installed on two Louis Dreyfus switcher locomotives at Terminal 86 Grain Facility with grant funding support through the Puget Sound Clean Air Agency. This project reduced fuel consumption from the two switcher locomotives by 50%.

2010 Implementation Efforts

In 2011, the Port of Seattle and the Puget Sound Clean Air Agency continues to support the EPA SmartWay commitments made by BNSF Railway and Union Pacific. The Port and the Puget Sound Clean Air Agency will continue to pursue grant opportunities with their rail partners to secure additional investments to further reduce emissions.

Harbor Craft

Port continues to support Puget Sound Clean Air Agency (PSCAA) in reducing emissions from harbor tug operations.

Trucks

• 100% of drayage trucks met the 2010 performance measure.

On January 3, 2011, the Port successfully launched the mandatory Clean Truck Program, which requires all drayage trucks entering the container terminals to have model year (MY) 1994 engines or newer, as stated in the Strategy. In 2015, the NWPCAS requirement will change to 80% of trucks meeting MY 2007 particulate matter emission standards or better, with 100% meeting the requirement in 2017. The Port of Seattle is evaluating how to accelerate this goal. These model years were selected based on the U.S. Environmental Protection Agency heavy duty diesel engine regulations. The first year the particulate matter emission standard was lowered was in 1994, with the second (and last) being in 2007. A MY 1994 truck is 2.5 to 6 times cleaner than a pre-1994 truck, while a MY 2007 truck is up to 60 times cleaner than a pre-1994 truck.

The Port negotiated amendments to our leases with the marine terminal operators to include implementation of the mandatory Clean Truck Program as a lease requirement. In order to ensure drayage truck compliance with this mandatory program, the Port developed and implemented a Drayage Truck Registry (DTR) that requires all trucks to go online (www.portseattledtr.org) and input the vehicle identification number (VIN) and license plate of the truck, as well as the owner contact information. The DTR uses an automatic VIN lookup system to determine the age of the truck engine. Once the truck is determined to be compliant, a sticker is issued that includes the truck license plate number, a barcode, and the unique DTR number; this sticker is required to be displayed on the driver's side door in order to gain access to the container terminals.

A significant component of the development and launch of the Clean Truck Program was the extensive outreach efforts aimed at ensuring all drayage truck drivers and companies were informed of the Clean Truck Program requirements and to help register compliant trucks. The Port engaged in significant education and outreach efforts with stakeholders (truckers, community and environmental groups, rail, marine terminal operators, shipping lines, shippers, labor, regulatory agencies, and elected officials). This outreach initiative included:

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- Distribution of program notification fliers and establishment of countdown signage at the terminal gates.
- Email notices on program status and updates.
- Follow up calls to truckers and trucking companies to ensure their trucks were successfully registered in the DTR.
- Trucker Resource Fairs to provide information and support, such as financing, insurance, and business resources, to independent truckers.
- Drayage trucker BBQ and registration events.
- Establishment of a Trucker Liaison in the Port's Office of Social Responsibility, hotline: 206-787-6888, and email: cleantrucks@portseattle.org.
- Partnerships with the African Chamber of Commerce and Port Jobs Employment Assistance to reach out to truckers and provide resources.

The Port of Seattle partnered with the Puget Sound Clean Air Agency (PSCAA) to concentrate on marine air quality programs. PSCAA, as part of its programs, contracted with Cascade Sierra Solutions to implement the 'Scrappage and Retrofits for Air in Puget Sound', or ScRAPS, Program, a buy-back, scrap, and replacement program for pre-1994 MY engine trucks. ScRAPS provides a \$5,000 (or blue-book value, whichever is greater) incentive to scrap pre-1994 MY trucks that perform drayage at the Port of Seattle. Launched on November 18, 2009, and sunset on January 31, 2011, ScRAPS successfully removed 280 pre-1994 MY drayage trucks (27 in 2009; 253 in 2010).

Port Administration

As part of the goal to reduce administrative emissions and reduce environmental impacts, the Port of Seattle accomplished the following in 2010:

- Maintained membership in the "Evergreen Fleets" organization, promoting cleaner air, minimizing greenhouse gas emissions, and reducing fuel consumption through smart and efficient fleet management practices.
- The Port of Seattle Fleet was ranked #20 in top 100 Government Green Fleets in 2010 (Government Fleet Magazine).
- Removed 5 pieces of equipment from the fleet and did not replace them; 1983 backhoe, 1999 truck, 1997 car, 1989 hydro-blaster and 1979 forklift.
- Replaced the 1995 Marine Maintenance Dump Truck with one that has 2010 emission standards.
- Replaced Marine Maintenance boiler with better air quality, compliant boiler.
- Increased filter changes in paint booth to quarterly.
- Increased bulk purchasing of cleaners and lubricants to reduce exposure.
- Started to purchase more latex and non-lead based sealers and paints vs. oil based.
- Actions and achievements associated with the Port of Seattle's ongoing efforts to reduce air emissions associated with administrative activities include the following:
- A member of the Marine Maintenance staff was appointed to the governance board of the Vehicle Maintenance Management Conference.
- With the implementation of Office Communicator and Computer screen cameras, we are reducing our need to travel to meetings by participating via tele-conferencing.
- Increased Flex schedules and more people are working from home in 2010.
- Increased use of plug-in hybrid car

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2011 Implementation Efforts

In 2011, the Port of Seattle will continue to purchase hybrid or alternative-fuel vehicles when replacing fleet vehicles. The Port will also work to increase recycling efforts and reduce water and electricity consumption at all Port facilities.

Second Puget Sound Maritime Air Emissions Inventory - 2011 EI:

The Port is working with the partners of the Puget Sound Maritime Air Forum to conduct a second inventory of all maritime-related diesel emission sources in the greater Puget Sound region. This second inventory is an update to the 2005 Puget Sound Maritime Air Emissions Inventory and is a voluntary public/private partnership to provide funding, data, in-kind assistance, technical expertise or a combination thereof. The 2011 EI will report calendar year 2011 criteria pollutant and greenhouse gas emissions from ocean-going vessels, harbor craft, cargo-handling equipment, heavy-duty trucks, and locomotives. The project, led by Port of Tacoma, has 13 funding partners:

- BNSF Railway
- Northwest Clean Air Agency
- North West & Canada Cruise Association
- Pacific Merchant Shipping Association
- Port of Anacortes
- Port of Everett
- Port of Olympia
- Port of Seattle
- Port of Tacoma
- Puget Sound Clean Air Agency
- Washington Department of Ecology
- Washington Department of Transportation Ferries Division
- Western States Petroleum Association

Total cost of the 2011 EI is estimated at \$230,000, not including significant in-kind contributions by the project partners. The 2011 EI will be an activity-based inventory following the same methodology as the 2005 EI, which was the first emissions inventory in the United States to include a detailed, activity-based inventory of greenhouse gases for maritime related sources.

The 2011 EI will cover the same geographical extent as the 2005 EI, which is the U.S. portion of the Puget Sound / Georgia Basin International Airshed, an area spanning approximately 140 miles south to north and 160 miles west to east, at its extremities. Data and technical guidance will be collected from ports, and individuals, agencies and companies (or their representatives) that own, operate, maintain and/or charter the equipment and vessels. Contributors include ports, terminal owners, vessel captains and engineers, equipment operators and others having first-hand knowledge of either equipment details or operational parameters. Regional clean air agencies, other government agencies and industry associations also will provide data.

The 2011 EI is expected to be published in mid-2012.

Clean Truck Program Request for Information (RFI):

As technologies to reduce diesel emissions and fuel consumption from drayage trucking are quickly evolving. Port staff is constantly looking for ways to learn and understand these developments. On

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April 19, 2011, the Port published an RFI, seeking information and ideas on alternative ways to upgrade trucks to U.S. EPA particulate matter (PM) emission standards equivalent to a 2007 model year (MY) diesel truck engine; no contract or funding was associated with this RFI. The Port received one response, which was from California Fleet Solutions for a comprehensive truck grant and lease program.

Seaport Air Quality Program Request for Qualifications (RFQ):

In order to meet the complex technical, policy, and program analysis required to continue to successfully implement the Strategy and associated diesel emission reduction project, Port staff developed a scope of work to secure professional consulting services to support these needs. On May 24, 2011, the Port published an RFQ seeking consultant support for the Seaport air quality program on technical, policy, and program analysis. On June 14, 2011, the Commission authorized staff to execute a Category 3 Indefinite Deliverable Indefinite Quantity (IDIQ) contract. The Statement of Qualifications (SOQs) were due to the Port on June 14, 2011. Staff expects to complete the contracting process in Q4 2011.

Emissions Reduction Options Analysis:

Port staff are currently evaluating options for implementation plans to reach the long-term (2015) Strategy goals, which includes the need to understand what types of emission reduction technologies the Port can implement, as well as the costs/benefits associated with each technology. In order to better understand this issue, Port staff conducted analyses on how much diesel particulate emissions could be reduced with a \$1 million investment for ocean-going vessels, cargo-handling equipment, and trucks. These calculations focus on total additional emissions reductions. Other factors will also affect the impact of the emission reductions, such as meteorology and proximity to people. These analyses are rough calculations that do not take into account equipment/engine specifics or operational characteristics. The following options were evaluated:

- Cargo-Handling Equipment
 - o Replace yard hostlers with new diesel, LNG, and hybrids
 - o Retrofit RTG with a hybrid system
- Ocean-Going Vessels
 - o ABC Fuels (before/after 2012 Emission Control Area [ECA])
 - o Pier 66 shore power (before/after ECA)
 - o Cargo shore power (before/after ECA)
 - Terminal 86 Advance Maritime Emission Control System (AMECS) (before/after ECA)
- Trucks
 - o Replace trucks with MY 2007 diesel, new diesel, LNG/CNG, and hybrid trucks
 - o Diesel/electric hybrid retrofits
 - o Natural gas engine conversions

The methodology for this analysis is as follows:

- Data Sources
 - o 2011 Drayage Truck Technology Assessment, E2 ManageTech
 - o 2005 Puget Sound Maritime Air Emissions Inventory
 - o Port of Los Angeles/Port of Long Beach Technology Advancement Program
 - o U.S. Environmental Protection Agency

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- California Air Resources Board
- Trucks
 - o On and off-terminal, Port of Seattle drayage
- Ocean-Going Vessels
 - Terminal based options evaluated for both total project reductions and normalized to \$1 million
 - o North American Emission Control Area implementation
- Cargo-Handling Equipment
 - o On-terminal activity

Tables showing the results of this analysis are included in the accompanying PowerPoint presentation.

Based on this analysis, staff made the following observations:

- Emission reduction benefits change as federal and international regulations come into force
- Emerging technologies may yield greater cost/benefit, but are not yet proven, or certified.
- Mass emission reductions do not take in to account proximity to populations

OTHER DOCUMENTS ASSOCIATED WITH THIS BRIEFING:

- 2010 Implementation Report
- PowerPoint presentation

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS:

- On February 9, 2005, the Commission adopted Resolution No. 3534, expressing commitment to Maritime Air Quality.
- On April 26, 2005, the Commission authorized to jointly develop Puget Sound Maritime Air Emissions Inventory and \$500,000 for supporting and conducting the project.
- On February 16, 2007, the Commission passed a series of environmental motions that required, in part, that staff present an air quality action plan for Commission approval.
- On March 27, 2007, the Commission authorized to amend the existing contract for the Air Emission Inventory in the amount of \$25,000, and to receive and spend supplemental funding for Puget Sound Maritime Air Emissions Inventory Project.
- On April 10, 2007, the Commission was briefed on the Puget Sound Maritime Air Emissions Inventory Project.
- On August 28, 2007, the Commission adopted Resolution No. 3585, endorsing the US Proposal to the International Maritime Organization seeking more stringent air emissions standards for ocean going vessels.
- On December 6, 2007, the Commission was briefed on the revised draft of the Northwest Clean Air Strategy.
- On January 22, 2008, the Commission adopted the Northwest Ports Clean Air Strategy.
- On April 1, 2008, the Commission and the public were briefed on the Northwest Ports Clean Air Strategy Implementation.
- On July 8, 2008, the Commission was briefed on the Port's Clean Truck Program.
- On September 2, 2008, the Commission was briefed on the Port's Clean Truck Programs for drayage operations at West Coast Seaports.
- On November 11, 2008, the Commission was briefed on the Port's Clean Truck Program.

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- On December 2, 2008, Commission authorized a transfer of \$500,00 to Puget Sound Clean Air Agency for the At-Berth Clean Fuels Vessel Incentive Program.
- On February 10, 2009, the Commission held a policy roundtable discussion of the Clean Air Program.
- On February 24, 2009, the Commission was briefed on the Port's first emission reduction credits banked with the Puget Sound Clean Air Agency.
- On March 31, 2009, the Commission was briefed on the customer support package and the Clean Air Program.
- On April 14, 2009, the Commission authorized the execution of lease agreements with Total Terminals, Inc. for Terminal 46, SSAT (Seattle) for Terminal 25/30, SSA Terminals for Terminal 18, and Eagle Marine for Terminal 5 to incorporate the Customer Support Package and the Ports Clean Air Program into those leases.
- On April 14, 2009, the Commission authorized an agreement with Puget Sound Clean Air Agency to transfer \$2.3 million (\$1.15m in 2009 & \$1.15m in 2010) from the Port's operating budget to support the implementation of the Northwest Ports Clean Air Strategy.
- On June 23, 2009, the Commission received a briefing on the Northwest Ports Clean Air Strategy 2008 Implementation Report.
- On August 25, 2009, the Commission authorized a revised Customer Support Package lease amendment with Total Terminals, Inc.; and authorized the Port to purchase energy efficient light fixtures and related equipment for T46 for an amount not to exceed \$680,000.
- On August 25, 2009, the Commission received a Clean Air Update.
- On January 12, 2010, the Commission was briefed on the Seaport's Air Quality Program.
- On June 8, 2010, the Commission authorized to supplement the value of the At-Berth Clean Fuels Vessel Incentive Program by \$541,500 for a total 2010 annual program budget of \$841,500. Within the \$541,500, \$135,000 represents funds that were originally approved in 2009, but were not used until 2010.
- On November 9, 2010, the Commission authorized to increase the amount of the At-Berth Clean Fuels Vessel Incentive Program by \$110,250, for a total 2010 annual program budget of \$951,750 to cover participation by the projected number of qualifying vessel visits for the remainder of the year.
- On December 7, 2010, the Commission was briefed on the Northwest Ports Clean Air Strategy Implementation Status.
- On January 4, 2011, the Commission adopted the "Motion to Accelerate Seaport Clean Air Goals to 2015."
- On February 1, 2011, the Commission authorized to sign agreement 20090046 Amendment 4 with the Puget Sound Clean Air Agency to transfer \$1,160,250 in funds to support the implementation of the Northwest Ports Clean Air Strategy, and to extend the end date from June 30, 2011, to June 30, 2013. Amendment 4 would increase the total amount transferred from the Port to PSCAA since 2009 to \$4,166,250.